NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

April 18, 2013

Group Chairman's Factual Report

OPERATIONAL FACTORS

DCA12IA141

A. INCIDENT

Location:	Soldotna, Alaska
Date:	September 5, 2012
Time:	Time: 1041 Alaska Daylight time (AKDT)[1]
Airplane:	DHC-8-100, N886EA

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C. SUMMARY

On September 5, 2012, at about 10:41 AM Alaskan Daylight Time, Era Aviation (d.b.a. Era Alaska) flight 874, a Bombardier DHC-8-103, registration N886EA, experienced an uncommanded left roll and uncontrolled descent during climb at about 12,000 feet. The flight crew regained control of the airplane at about 7,000 feet and the flight returned to Ted Stevens Anchorage International Airport (ANC), Anchorage, Alaska. There were no injuries to the 12 passengers or 3 crew members, and the airplane was not damaged. The flight was operating under the provisions of 14 Code of Federal Regulations Part 121 as a regularly scheduled passenger flight between ANC and Homer Airport (HOM), Homer, Alaska. Daylight, instrument meteorological conditions prevailed at the time of the incident

D. DETAILS OF THE INVESTIGATION

[1] All times in the report will be in Alaska Daylight Time

The Operations and Human Performance Group Chairmen conducted telephone interviews with the two incident pilots on September 7, 2012, and with the assistant chief pilot and the vice president of operations on September 18, 2012. Katherine Wilson of NTSB, David Keenan of the FAA and Bill Kolstad of Era Aviation assisted in the pilot interviews and Bill Kolstad assisted in the management interviews.

Requests were made to Era and Bombardier for flight documents, crew information and manuals and to the FAA for crew background documents.

An Operations/Human Performance Group was formed on September 24, 2012 with the addition of Steve Albert, POI of Horizon Airlines, as the FAA representative and David Senko, a Dash 8 line check airman, as the Era representative. TSB Canada and Bombardier were invited to attend but declined. The Operations/Human Performance Group conducted interviews of company personnel Monday and Tuesday, September 24 and 25. On Wednesday September 26 the group met at the Denali Certificate Management Office (CMO) in Anchorage and conducted interviews of FAA personnel. On Thursday Cox and Allahyar observed Era flights in the morning and met with the group at the CMO to reconcile interview notes. Eric West of the FAA provided witness statements.

The Operations/Human Performance Group conducted additional interviews with FAA inspectors and Cox and Allahyar made telephone calls to Era personnel and former managers at Grant Aviation and Frontier Flying Service during November and December of 2012.

E. FACTUAL INFORMATION

1.0 History of the Flight

The incident flight was the third of six scheduled flights for the crew on September 5, 2012. The aircraft logbook showed the crew's first flight departed ANC for Cordova, Alaska (CDV) at 7:41 AM and returned to ANC at 09:59 AM. The aircraft flight log showed the incident flight, Era Flight 874, departed the gate at ANC at 10:21 AM and took off at 10:29 AM. The flight's destination was Homer, Alaska (HOM), and the planned flight time was 34 minutes. The flight's load manifest showed 11 adult and 1 infant passengers aboard, 4000 lbs. of fuel and a takeoff weight of 30,325 lbs.

The crew's flight release weather package showed a forecast for the area along the planned route of flight as having occasional moderate turbulence below 12,000 feet AGL and isolated moderate rime icing between 10,000 and 22,000 feet AGL with a freezing level of 5,000 feet AGL. The forecasts for both ANC and HOM were for broken to overcast skies with good surface visibility and gusty winds.[2] The first officer (FO) stated in an interview that there was a forecast for icing and turbulence on the departure paperwork but it was nothing out of the ordinary for that time of

[2] The forecast for ANC was for winds from 150 degrees true at 15 gusting to 25 knots, greater than 6 statute miles visibility, rain showers, scattered clouds at 3,500 feet AGL and overcast skies at 5,000 feet AGL. The forecast for HOM was winds from 220 degrees true at 15 gusting to 25 knots, greater than 6 statute miles visibility, light rain showers, and broken clouds at 3,500 feet AGL.

year in Alaska. The captain stated there was nothing unusual about the weather packet except for high winds and a SIGMET[3] for the southwest Alaska area.[4]

According to the FO, the flight was cleared to Homer via V-438 at a cruise altitude of 10,000 feet MSL.[5] Both pilots stated in interviews that the captain, who was the pilot flying (PF), engaged the autopilot at approximately 1000 feet AGL[6] after takeoff. The captain stated he engaged the indicated airspeed button on the advisory display unit and set a speed of 150 to 160 knots. The FO recalled that the autopilot was on but he could not recall what mode was selected or at what airspeed they climbed.

The flight entered a cloud deck and began accumulating ice between 7000 and 8000 feet MSL, and the captain turned on all de-icing equipment. The FO described the icing as light to moderate and he thought it was not significant. Both crewmembers reported that the de-icing equipment was working normally and was within its capability. The flight remained in icing conditions after level-off at 10,000 feet[7]. The captain stated that there was no turbulence but that icing was at the high end of moderate at that altitude and they needed to get out of it to continue the flight. After a short time the crew requested and was cleared by Air Traffic Control (ATC) to climb into a block altitude of 10,000 to 14,000 feet MSL[8] in order to try to get out of icing conditions. Commencing climb, the captain initially set 14,000 feet in the altitude alert controller.

The captain believed he engaged the indicated airspeed button when he initiated the climb out of 10,000 feet and he did not use the vertical speed mode during the flight. He did not recall the position of the throttles but he did not manipulate them once he initiated the climb. He thought the climb airspeed was set at 150 to 160 knots. The FO did not recall if the captain verbalized his intended climb airspeed. Neither pilot could recall their climb airspeed. An orange "fast-slow" type speed control indicator[9] was installed in each pilot's attitude director indicator (ADI), but neither pilot was looking at it.

During climb the captain stated he was monitoring the indications of icing. The FO stated he was monitoring the de-icing panel, looking outside to make sure the boots were inflating and deflating in the proper sequence, looking at the propeller spinners, windshield wipers and windshield. The FO said he was also getting ready to communicate with the arrival station and taking care of paperwork in preparation for landing. The captain said the FO was pulling out his charts for the approach to HOM.

Passing about 11,500 feet the flight began to emerge from the tops of the clouds and the captain set the altitude alert controller to level at 12,000 feet. As the captain began to level off the airplane began to shudder. The crew attributed this to an unbalanced condition of the propellers due to uneven shedding of ice. The shudder increased rapidly and without warning the airplane

[3] Significant meteorological information
[4] Several AIRMET's were in effect, but no SIGMET's. An AIRMET is for conditions less severe than a SIGMET.
[5] Above mean seal level
[6] Above ground level
[7] The captain of another Era flight which had flown in the same direction as Era 874 but slightly earlier stated that the most icing on his flight was at 10,000'.
[8] The "block altitude" clearance allowed the flight to operate at any altitude from 10,000' to 14,000'.
[9] The speed control indicator is centered on the left side of each ADI when the airspeed is at 1.3 Vstall.

rolled left, followed immediately by a pitch down. According to both pilots, no stick shaker warning activated before the airplane pitched over.

The captain attempted to control the airplane by rolling it to wings level and pulling nose up, but he was unable to get control. The captain made a combination of control and power inputs, pushing the yoke and power forward and back as the airplane descended rapidly. The captain recalled seeing a bank angle of 45 to 50 degrees and nose down pitch of 30 degrees. He said he "only saw brown on the artificial horizon (ADI)." He did not recall seeing any speed during the event as he "never once" looked at the airspeed indicator. The FO did not have his hands on the controls and could not say what control inputs the captain made or what speed they were at during the descent and recovery. Descending through 8000 feet MSL the captain saw the rate of descent decrease as he brought the nose up. The FO said they recovered the airplane at an altitude of a little over 7000 feet.

In an interview, an Era captain who was in the vicinity said he heard the incident flight's radio transmissions during its descent. He heard the FO's voice, 1 to 3 audible horns[10] and a rattling sound. The FO on the other Era flight thought the rattling sound was similar to a stick shaker sound.

After leveling off, the FO requested a vector from ATC in order to be at a safe altitude. According to an ATC recording of the event, Anchorage Center cleared the flight to descend to 6000 feet at pilot's discretion and said "approved deviation as necessary." The crew told Anchorage Center they would fly a heading of 300 degrees but did not state their intentions. After being handed off, the crew told Anchorage Approach Control they wanted to return to ANC and after the Approach Control asked if they needed any assistance, they declared an emergency due to having lost control of the airplane. The crew completed the flight uneventfully, and according to the airplane logbook, landed at 1056. After landing, the crew reported they were okay and would like to taxi to the gate. The tower terminated the emergency and the flight parked at 1059.

The captain said he did not receive any reports of injury during or after the event. The flight attendant told him after they landed that he was up serving passengers during the event but was able to get into a passenger seat and fasten his seatbelt.

The captain entered the following discrepancy in the logbook after landing: "Aircraft performed uncommanded roll and pitch down. Considerable ice was on the plane. Suspect considerable G forces sustained by aircraft." In the remarks section of the flight release he wrote "return to ANC due WX." In an interview, the captain said that during the event he did not think he was experiencing an aerodynamic stall, but in retrospect he thought that it was possible.

[10] The landing gear warning horn will sound if the landing gear is not down and locked, one or both power levers are at or near flight idle, and airspeed is less than 130 knots.

2.0 Flight Crew Information

2.1 The Captain

The captain of the flight was Steven G. Novak. According to company records the captain was hired November 27, 2000. According to the Era Aviation chief pilot, the captain was a DHC-6 Twin Otter FO from November 2000 to June 2005, a DHC-8 FO from June 2005 to November 2007, and a BE1900 captain from November 2007 to May 2012. The captain stated in an interview that he had upgraded to captain on the DHC-8 in April, 2012. According to Era Aviation records, the captain completed his initial 100 hours in command[11] on the DHC-8 on June 29, 2012. FAA records showed that the captain had no record of prior accidents, incidents or enforcements.

A first officer said the captain ran the cockpit professionally, with good cockpit resource management (CRM), and he was happy to work with him.

A former Dash 8 check airman recalled a time the captain attempted to land three times at an airport where crosswinds exceeded 40 knots before diverting to another airport. He said the event captain performed well in the simulator but some copilots had expressed concerns that he sometimes lacked focus and attention and was not always "in the moment."

The Era Aviation assistant chief pilot stated the event captain paid attention in class, asked questions, and interacted well with others in class. He had heard from other line pilots that the incident captain was a subpar captain and "not the best of the best." He had heard that the captain was a nice guy but some pilots said they had to watch him carefully. Those pilots said he wasn't unsafe but he could get behind the airplane.

The Era Aviation chief pilot stated that he had received no reports or complaints about the captain from FO's. He said when he flew with the captain "he made me look good."

The Era Aviation Vice President of Operations stated that the captain had recently operated a flight without the logbook on board and as a result he was planning to issue the captain an administrative action. The Vice President of Operations said the flight without the logbook caused a delay for passengers and an FAA inspector and was a high profile event "due to his complacency."

An examination of Alaska State driving records indicated that the captain had ten moving violations in the five years prior to the incident. A letter in the captain's company records stated that he was not allowed to drive company vehicles due to an insurance company requirement.

2.1.1 The Captain's Pilot Certification Record

Records from the FAA showed the captain's progressive record of certification and original issue dates as follows:

[11] As required by 14 CFR 121.434.

Private Pilot – Airplane Single Engine Land – January 24, 1999
Private Pilot – Airplane Single Engine Land – Instrument Airplane – October 21, 1999
Private Pilot – Airplane Single and Multiengine Land – November 28, 1999
Multiengine limited to VFR only
Commercial Pilot – Airplane Single and Multiengine Land – January 15, 2000
Commercial Pilot – Airplane Single and Multiengine Land – February 6, 2000
Instrument Airplane
DHC-8 type rating – SIC only – September 15, 2006
Airline Transport Pilot – Airplane Multiengine Land – November 16, 2007
Commercial Privileges – Airplane Single Engine Land
BE-1900 – Second in Command Required
DHC-8 – SIC only
Airline Transport Pilot – Airplane Multiengine Land – April 30, 2012
DHC-8
BE-1900 – Second in Command Required

Flight Instructor – Airplane Single Engine Land – April 16, 2000
Flight Instructor – Instrument Airplane – May 21, 2000

The captain was disapproved for his initial Commercial Pilot certificate on January 11, 2000 for area 8, emergency procedures. He successfully completed the certificate on January 15, 2000. The captain was disapproved for his initial Flight Instructor – instrument airplane certificate on May 17, 2000 for area 8, emergency procedures. At the time he had total flight time of 184 hours. He successfully completed the certificate on May 21, 2000.

2.1.2 The Captain's Pilot Certificates and Ratings Held at Time of the Accident

The PIC's FAA Airman Certificate showed the following:

Airline Transport Pilot: Airplane Multiengine Land
Commercial Privileges: Airplane Single Engine Land
Type Ratings: BE-1900; DHC-8
Limitations: BE-1900 Second in Command Required

Records from the FAA showed the PIC's most recent medical certificate to be:

First Class
Date: May 17, 2012
No limitations

2.1.3 The Captain's Recent Training and Proficiency Checks Completed

Flight Operations Ground Training –General Subjects – Recurrent – August 14 to August 16, 2012

Line check (PIC) – DHC-8 initial – May 9, 2012
Special Operations Training – May 5, 2012
Pilot Proficiency Check (PIC) – DHC-8 Initial – April 30, 2012
Flight Operations Ground Training –DHC-8; Initial Systems Integration – April 18, 2012
Flight Operations Ground Training –DHC-8; Initial Aircraft Systems – April 7 to April 16, 2012

The Era Aviation chief pilot stated that "special operations training" was 1.2 flight hours of routine aircraft familiarization training.

2.1.4 The Captain's Flight Times

The captain's flight times, based on the captain's statements and Era Aviation employment records:

Total pilot flying time	8,000 hrs.
Total Pilot-In-Command (PIC) time[12]	4,000 hrs.
Total DHC-8 flying time	4,000 hrs.
Total DHC-8 PIC time	258 hrs.
Total flying time last 24 hours	6.8 hrs.
Total flying time last 7 days	11.7 hrs.
Total flying time last 30 days	47.3 hrs.
Total flying time last 90 days	154 hrs.

2.2 The First Officer

The FO of the flight was Glenn M. Kramer. The FO had flown C-207's for Grant Aviation in western Alaska from December 2004 to September 2007. According to Grant Aviation's chief pilot at the time the FO was there, he was "a nice guy but a very substandard pilot." He said the FO "couldn't do two things at one time." While he was at Grant Aviation the FO attempted to qualify as a pilot on the twin engine PA-31 but was unsuccessful.

The FO was hired by Frontier Flying Service on September 24, 2007. He flew as a BE-1900 FO for approximately 11 months and then transitioned to the PA-31. According to Frontier's chief pilot at that time, the FO was given 100 hours of initial operating experience (IOE) in the PA-31. NTSB records show the FO had an accident on August 4, 2008 in Aniak, Alaska.[13] According to an FAA inspector who was in the Anchorage FSDO at the time, the accident took place on the FO's first day of flying after he had completed his initial operating experience (IOE) in the PA-31.

Following the accident the FO was scheduled by the FAA for an ATP re-examination ("709") flight which was conducted on September 12, 2008. The type of airplane flown was a PA-31, the

[12] Captain's estimate
[13] NTSB investigation ANC08LA097

type the FO was flying during his accident. The FAA inspector who conducted that check stated in an interview that the FO's performance in taxiing, precision approach, missed approach and airspeed control was unsatisfactory and his overall competency was in question. He was given the opportunity to retake the check or surrender his ATP certificate and he chose to surrender the ATP certificate. The FAA agreed to re-issue Mr. Kramer's commercial certificate and after a short absence he requalified in the BE-1900 as an FO at Frontier Flying Service. Following the merger of Frontier and Era Aviation, the FO transferred to Era as a DHC-8 FO on August 27, 2010. The FO stated in an interview that he had flown the DHC-8 for about 2 years.

FAA records did not show the FO had any other accidents, incidents or enforcements.

A captain who had flown with the FO at Era stated that his stick and rudder skills were acceptable and he was progressing well, but he could not do a lot of things at once and "needed time to get his ducks in a row." He stated the FO's situational awareness was weaker than other pilots. Another captain who had flown with the FO said he was easy to get along with, but he could get flustered and become easily overwhelmed with routine tasks such as weight and balance. She said four other pilots agreed with that assessment. Another captain said he was conscientious about complying with rules and regulations.

The Era Aviation assistant chief pilot stated the FO was one of his lower end students in ground school. He could pass the test and get by but he was struggling. The FO had to work hard and make sure he understood what was going on clearly. He had also heard from other pilots that the FO was a weak co-pilot and had a tendency to get behind the airplane. He had not heard of the FO being unsafe or losing control of the airplane, but pilots would say that normally their co-pilot helped them throughout the day but in the case of this co-pilot, they felt they were helping him.

The Era chief pilot stated he had received a report that the FO was not attentive to pilot monitoring duties, but flew with him and found the opposite to be true. The chief pilot said he thought that he might have had some personality conflicts with other pilots. The chief pilot said he "had a rough start fitting in" but that he was adapting and "figuring out the two pilot routine."

2.2.1 The FO's Pilot Certification Record

Records from the FAA showed the first officer's progressive record of certification and original issue dates as follows

Private Pilot – Glider – Aero Tow Only – November 10, 1992
Private Pilot – Airplane Single Engine Land; Glider – January 12, 2002
Private Pilot – Instrument Airplane – March 16, 2003
Commercial Pilot – Airplane Single Engine Land – January 2, 2004
Commercial Pilot – Glider – March 10, 2004
Airline Transport Pilot (ATP) – Airplane Multiengine Land – September 7, 2006
BE-1900 type rating – SIC privileges only – October 28, 2007
Airline Transport Pilot – surrendered to FAA – September 18, 2008
Commercial Pilot – Airplane Single and Multiengine Land, Instrument Airplane, Glider,

BE-1900 SIC Privileges only – re-issued September 22, 2008
DHC-8 type rating, SIC privileges only – November 19, 2010

Flight Instructor – Glider – May 21, 2004

The FO was disapproved for his Commercial Airplane Single Engine Land certificate on November 4, 2003. Areas of operation not approved were short field landing, 180 degree power off landing, steep turns and cross country navigation. The certificate was approved on January 2, 2004.

The FO was disapproved for his Flight Instructor – Glider certificate on April 28, 2004. Areas of operation not approved were launches and landings, slips to landings, timing, judgment, and control technique during transition from slip to touchdown – failure to align longitudinal axis with desired landing path. The certificate was approved May 21, 2004.

The FO was issued his original ATP on September 7, 2006 by a designated pilot examiner (DPE) in Kingman, Arizona.[14]. The FO was disapproved for his ATP certificate on a subsequent check on September 12, 2008. The FO agreed to surrender his ATP in exchange for a re-issuance of his commercial certificate with single and multiengine ratings.

2.2.2 The F/O's Pilot Certificates and Ratings Held at the Time of the Incident

The first officer's FAA Airman Certificate showed the following:

Commercial Pilot: Airplane Single and Multiengine Land
Instrument Airplane
Glider
Type Ratings: BE-1900 and DHC-8 SIC privileges only

Records from the FAA showed the first officer's most recent medical certificate to be:

First Class
Date: June 21, 2012
No limitations

2.2.3 The F/O's Recent Training and Proficiency Checks Completed

Special Operations Training – May 7, 2012
Line check (SIC) for "SEPCO"[15] – May 7, 2012
Flight Operations Ground Training –DHC-8; Recurrent Aircraft Systems – February 17 to February 19, 2012
Flight Operations Ground Training –DHC-8; Recurrent General – February 20 to February 23, 2012

[14] That examiner's DPE status was revoked in December 2012. See section 6.2 of this report
[15] Shell Exploration and Production Company

Pilot Recurrent Proficiency Check (SIC) – DHC-8 Initial – October 29, 2011
Pilot Proficiency Check (SIC) – DHC-8 Initial – November 19, 2010
Special Operations Training – DHC-8 Initial -November 23, 2010
Initial Operating Experience (IOE) completed – December 23, 2010

The Era Aviation chief pilot stated that the SIC line check was a non-regulatory customer requirement. He stated the "special operations training" was routine aircraft flight familiarization training.

2.2.4 The F/O's Flight Times

The accident F/O's flight times, based on pilot statements and Era Aviation employment records:

Total pilot flying time	6,000 hrs.
Total PIC time	3,000 hrs.
Total DHC-8 second-in-command time	2,362 hrs.
Total flying time last 24 hours	6.8 hrs.
Total flying time last 7 days	13.9 hrs.
Total flying time last 30 days	89.3 hrs.
Total flying time last 90 days	253 hrs.

3.0 The Airplane

The incident airplane was a Bombardier DHC8-103, registration N886EA, a twin engine turboprop aircraft. It was commonly referred to as the "Dash 8." The DHC8-100 series was the first version of the design produced. Later models were the DHC8-200, -300 and -400. The DHC8 was originally produced by de Havilland of Canada beginning in 1984. The DHC8-400 model is now produced by Bombardier. According to Bombardier data, as of December 31, 2012 a total of 1,096 Dash 8's had been built, of which 299 were the DHC8-100 version.

At the time of the incident, Era Aviation operated 6 Dash 8's. According to the Era assistant chief pilot, one airplane had an electronic flight instrument system (EFIS), and five airplanes, including the incident airplane, had electromechanical flight instruments.

3.1 Airplane Performance

3.1.1 Weight and Balance

The following weight and balance information was taken from the load manifest for the flight. Limitations were obtained from the Era Aviation Dash 8 Flight Standards Manual (FSM).

Basic Operating Weight	23,853 lbs.
Passenger Weight (11 adult passengers x 185 lbs.)[16]	2,035 lbs.

[16] Weight of the infant passenger is considered negligible according the FSM page 7-29.

Baggage Weight	437 lbs.
Zero Fuel Weight	26,325 lbs.
Maximum Zero Fuel Weight	31,300 lbs.
Fuel[17]	4,000 lbs.
Ramp Weight	30,325 lbs.
Maximum Ramp Weight	34,700 lbs.
Takeoff Weight	30,325 lbs.
Maximum Allowable Takeoff Weight	34,500 lbs.
Maximum Landing Weight	33,900 lbs.
Takeoff Center of Gravity	21 % MAC

The flight load manifest showed a center of gravity (CG) index of 11.2, which is the equivalent of 21.0% of the mean aerodynamic chord at 30,000 lbs. The forward limit was 17.2 % MAC and the aft limit was 38% of MAC at that weight.

Era's FSM paragraph 401, "Fuel Computations," provided an estimated normal fuel burn for flights from ANC to HOM of 740 lbs.

3.1.2 Stall speeds chart

The de Havilland Dash 8 approved flight manual (AFM), PSM 1-81-1A, provided a chart of the aircraft's stalling speeds for various gross weights and flap settings on page 5-1-7, Figure 5-1-1.[18]

3.2 Airplane Systems

The following information is derived from the de Havilland Operating Data Manual (ODM).

3.2.1 Autoflight – flight guidance controller and displays

According to chapter 7 of the de Havilland ODM, the flight guidance computers generate flight guidance commands, provide autopilot pitch, roll and yaw damper control, monitor the operation of the automatic flight control system (AFCS), and manage data transfer of the data buses. The flight guidance controller is used to engage the flight guidance system, select the operating modes, select navigation data for the horizontal situation indicator (HIS), and control navigation source switching. The ID-802 advisory display units display AFCS status and provide messages to the crew. Messages are displayed on four different lines.

Pitch Attitude Hold

The pitch attitude hold mode is activated when a flight director roll mode is selected without an accompanying pitch mode. PITCH HOLD is annunciated on the advisory display unit. Pitch reference may be changed with the TCS button.[19] With the autopilot engaged the pitch wheel on the flight guidance controller may be used to change then pitch reference attitude. Pitch attitude hold is cancelled by any vertical mode or automatic capture of a vertical mode.

[17] Fuel figure is considered net of fuel consumed for taxi according to the FSM page 7-29.
[18] See attachment 4
[19] The touch control steering (TCS) pushbutton on the pilot and copilot control wheel uncouples autopilot servos without disengaging the autopilot, allowing pilots to manually change attitude, altitude or vertical speed.

Vertical Speed Hold Mode

The vertical speed hold mode is used to automatically maintain the aircraft at a selected vertical speed reference. The pilot maneuvers the aircraft to a desired climb or descent attitude and engages the mode at the vertical speed established. The reference vertical speed can be changed with the TCS button. When engaged, VS is displayed in green on the ID-802 and feet per minute vertical speed is displayed. The vertical speed reference can be set using the pitch wheel. VS mode can be cancelled by pressing the VS button, selecting another vertical mode, selecting go-around or coupling to the cross-side HSI.[20]

Indicated Air Speed Hold Mode

Indicated Air Speed Hold Mode is used to maintain a selected airspeed reference. It is selected with the IAS button and IAS in knots is displayed on the ID-802.

3.2.2 Flight Instruments

Airspeed Indicators

According to chapter 14 of the de Havilland ODM, two pitot heads and two static heads supply pitot and static pressure for operation of airspeed indicators. The pitot head on the left side of the fuselage supplies the pilot's airspeed indicator and the right side pitot head supplies the copilots' airspeed indicator. Each pitot and static head is equipped with an anti-ice heater controlled from the ice protection panel.

Attitude Indicators

The incident airplane was equipped with electromechanical attitude indicators. Two attitude/heading reference systems (AHRS) provide attitude information to the attitude indicators (ADI's). The attitude heading reference unit (AHRU) used vertical and directional gyros and accelerometers to sense rate of airplane movement.

The ADI's combine a spherical attitude display with lateral and vertical flight guidance command bars. A speed control indicator on the left side of each ADI provides a FAST or SLOW speed indication relative to 1.3 times the airplane stall speed (Vs). [21]

3.2.3 Ice and Rain Protection

Protection from airframe icing is provided by a pneumatic airframe deicer, supplemented by anti-icing heaters for the propeller blades, pitot tubes and static ports, stall warning transducers, engine intakes, windshields, cockpit side windows and elevator horns. The airframe deicing system uses regulated engine bleed air to inflate pneumatic rubber boots bonded to the leading

[20] See attachment 5
[21] See attachment 6

edges of the wing, horizontal and vertical stabilizer, nacelle intake and wing inner root leading edges. Inflation of the boots is controlled automatically in a timed sequence and manual control of boot sequencing is also available. Boot inflation lights on the ice protection panel monitor the sequencing and confirm boot inflation.

3.2.4 Warning Systems

Stall Warning

The stall warning system provides stick shaker warning of an impending stall and visual indication of speed relative to stall speed. Left and right stall warning systems each have a lift computer, a vane type lift transducer, a control column shaker, a speed control indicator and a caution light. Each system receives signals from the flap indication unit and the proximity switch unit.[22] The lift transducers are heated on the ground and in flight. Both stick shakers may be powered from either lift computer.

During low speed flight the lift transducers, one on the leading edge of each wing, transmit angle of attack information to their lift computers. The computers combine this signal with flaps position data and accelerometer inputs to provide a stall speed warning threshold. The computers activate the stick shakers whenever the threshold is reached to indicate an impending stall. The lift computers also provide low speed reference data to the speed control indicators which present airspeed relative to 1.3 Vs.

Landing Gear Warning

Landing gear warning horns sound at a steady 2000 Hz tone when the landing gear is not down and locked, when one or both power levers are at or near flight idle and when airspeed is below 130 knots. The horns cannot be muted if both power levers are retarded. Certain other conditions will also cause the horns to sound.

3.3 Airplane Procedures

The following information is taken from the Era Aviation FSM, the Era Aviation FOTP, and the de Havilland Airplane Flight Manual (AFM).

3.3.1 Automation Policy

The Era Aviation FOTP section 210, “Automation Policy,” stated:

Use of Vertical Speed Mode

“VS Mode: The vertical speed (VS) mode shall not be used for sustained climb if the autopilot is engaged since the airspeed is not protected and a stall may occur. Vertical Speed may be used to establish the initial climb pitch attitude, then a pitch or speed mode must be used.”

[22] Ground sensing weight on wheels

Monitoring Autoflight Systems

"Era Aviation's aircraft autoflight systems incorporate aural and/or visual cues to assist flight crew monitoring of current and future autoflight modes. It is of vital importance that mode awareness be maintained, especially during seemingly subtle autoflight mode changes.

The PF has direct responsibility for commanding the aircraft's flight path and the PM, or monitoring pilot, is responsible to make callouts when differences between the desired and actual paths are noted. These responsibilities cannot be delegated to an automatic system.

If any component of the autoflight system is not operating as expected, it shall be disengaged immediately."

3.3.2 Climb and Cruise Performance

Era's Flight Standards Manual (FSM) paragraph 401, "Climb Performance," stated:

"Climb speeds of 160 knots (type II) up to 18,000 feet, minus 5 knots per 1000 ft. above 18,000 feet, have been selected to obtain the best rate of climb consistent with maintaining high forward velocity. Alternate climb speeds of 130 knots (type III) from sea level to 25,000 feet or 195 knots (type I) up to 10,000 feet, minus 5 knots per 1,000 feet above 10,000, may also be used if desired. Climb power is based on the maximum permissible torque for a specific outside air temperature and altitude."

According to Era's Flight Operations Training Program (FOTP), paragraph 0263, "climb profile," to set climb power the pilot monitoring (PM) initially sets the engine condition levers to 1050 RPM and torque to 90%. It says normal climb speeds are:

- 130 knots (type III)
- 160 knots (type II)
- 195 knots (type 1)

Paragraph 0263 also stated after the pilot flying (PF) engages the autopilot he assumes responsibility for power adjustments.

FOTP paragraph 270, "climb and cruise power," states:

"A climb and cruise power chart derived from AFM data is furnished in the cockpit for use in setting power during climb and cruise. The data is in torque form because the Dash 8 has engines designed to produce a specific torque for a given temperature/ pressure combination. To eliminate the need to refer to the chart every 1,000 feet in climb, a constant ITT climb procedure is prescribed below to enable the crew to climb and cruise at charted power by using a constant ITT."

"Climb at 90% torque until ITT rises to 715°, then maintain ITT at 715° until leveled off and accelerated to cruise airspeed, then set charted cruise power. Check the chart during climb as desired. Cruise power may be set roughly by reducing ITT to 695°, then reducing NP to 900. Then confirm and set charted cruise power."

Era's climb and cruise power charts are shown in attachment 3. According to the Era chief pilot, these charts were derived from the de Havilland ODM pages 23.10.18 through 23.10.31 and 23.20.44 through 23.20.49.

3.3.3 Flight in Icing Conditions

The Era Aviation FOTP section 269, "Severe Icing," stated that in the event of severe icing conditions:

"1. Immediately request priority handling from ATC to facilitate a route or altitude change to exit the severe icing conditions.
2. Avoid abrupt and excessive maneuvering that may provoke control difficulties.
3. Do not engage the autopilot. If the autopilot is engaged, hold the control wheel firmly and disengage the autopilot
4. If an unusual roll response or uncommanded roll control movement is observed, reduce the angle-of-attack.
5. Do not extend flaps during extended operations in icing conditions. Operations with flaps extended can result in a reduced wing angle-of-attack, with the possibility of ice forming on the upper surface further aft on the wing than normal, possibly aft of the protected area
6. If the flaps are extended, do not retract them until the airframe is clear of ice.
7. Minimum airspeed 150 kts.
8. Set maximum continuous power.
9. Report these weather conditions to ATC"

***"NOTE:** This operation as worded only limits continued flight in severe icing conditions, as defined by the visual cues described. Forecasted (or previously reported) icing conditions need not cause any operational impact as the result of compliance with the Airworthiness Directive. The Airworthiness Directive is also not intended to limit dispatch or landing in freezing precipitation, as these maneuvers result in relatively short duration exposure to the conditions."*

Section 269 provided a table showing minimum speeds for icing conditions[23]. The table references the de Havilland AFM section 4.7.2.2:

[23] Vsec is the single engine climb speed and pertains to engine failure after takeoff.

V2	V2
VSEC	VSEC +15 kts
Descent Clean	VREF +15 kts
Holding	VREF +15 kts
Approach and Go-Around Flaps 5°	V2 + 15 kts
Approach and Go-Around Flaps 15°	V2 + 10 kts
Landing VREF flaps 15°	VREF + 10 kts
Landing VREF flaps 35°	VREF + 5 kts

3.3.4 High Angle of Attack Recovery Procedures

The DeHavilland AFM emergency procedures chapter contained a section 3.18, "high angle of attack recovery procedures," dated March 4, 2011.[24] Under the heading "recovery from stall warning and stall (stick shaker, unusual airframe buffet, uncommanded wing drop), the first step was:

- *"Autopilot – disengage, and pitch attitude – reduce"*

This was followed by a note which stated:

> *"Relax any control column pull force and/or move the control column forward sufficient to achieve a reduction in pitch attitude.* ***This action can result in a loss of altitude***[25]*."*

A review of the Era Aviation FSM and FOTP showed that there was no corresponding emergency procedure for high angle of attack recovery in these manuals.

3.3.5 Era Aviation Approach to Stalls Guidance

Era Aviation's procedures for stall recognition and recovery were contained in its FOTP, chapter 9, "Flight Training Procedures, Maneuvers, and Functions," paragraph 907, "Approach to Stalls."[26] With reference to pitch control and maintaining altitude during recovery, Section 907 states in part:

[24] See attachment 7
[25] Emphasis added
[26] See attachment 8 for the full text of section 907.

*"Pilot performance is judged on ability to RECOGNIZE the approach to stall, prompt action in initiating a smooth recovery, **without excessive loss of altitude**[27] while holding the assigned heading."*

*"Stall recovery is prompt following relaxation of back pressure or application of forward pressure on the control column. **Altitude loss can be eliminated**[28] by the prompt application of power. Excessive forward movement of the column should be avoided."*

Era Aviation's clean configuration stall recovery procedure as shown in section 907 was:

"1. Start recovery at earliest warning (stick shaker).
2. Advance power levers and call "Max Power".
*3. Reduce back pressure to stop shaker and **minimize altitude loss**[29]. GA mode may be used.*
4. Accelerate to and climb at VSEC back to original altitude.
5. Call "climb power" and accelerate to 150 knots.
6. Call "40 Torque" approaching 150 knots."

4.0 Company Overview

Era Aviation was a 14 CFR Part 121 airline operating 6 BE-1900 and 6 DHC-8-100 aircraft based on Anchorage, Alaska. According to the FAA website, Era Aviation was first certificated in 1979, and according to Era Alaska's website, scheduled passenger service began in 1983. According to FAA records, Era Aviation had held a 14 CFR part 121 certificates since 1991. Era Aviation was merged with Frontier Flying Service, Hageland Aviation and Artic Circle Air Service in 2010 to form Era Alaska. Arctic Circle was closed in 2011. Frontier Flying Service and Hageland Aviation continue to operate as 14 CFR Part 135 air carriers under the Era Alaska organization. At the time of the incident Era Aviation employed 73 pilots.

4.1 Operations Management

The Era Aviation General Operations Manual (GOM), section 1, described the company's organization, including its organization chart[30] and the duties and responsibilities of managers. Pilots were supervised by the chief pilot, who reported to the vice president, operations, who in turn reported to the company president. The organization chart identified the 14 CFR Part 119 required management personnel, and the Operations Specification A007 dated December 19, 2006 identified six management personnel designated to receive SAFO's and INFO's.[31] These managers were Jeff Sharp, Jeff Mahar, and David Kolstad for Operations information and David Purcell, Robert Torrey and Steve Cotting for airworthiness information.

[27] Emphasis added
[28] Emphasis added
[29] Emphasis added
[30] See attachment 2
[31] Safety Alert for Operators and Information for Operators

4.1.1 Vice President, Operations

The GOM section 1.2.2 stated that the vice president, operations had the overall authority and responsibility for the flight operations, maintenance, inspection and product reliability/supply departments. In addition to other duties, he was also was described as "the primary contact person on behalf of the company when communicating with FAA representatives (principal inspectors) for regulatory issues regarding the air carrier certificate." The organization chart showed that vice president also held the CFR 119 required position of director of operations (DO).

The GOM section 1.2.4 stated that the DO had the authority and responsibility for dispatch and operational control of all flights, determined the qualifications and assignments of check airman and PIC's, established manpower policies and procedures, flight operations policies and procedures, and company compliance with FAR's, policies, and operations specifications.

In an interview, the vice president, operations, Captain Jeff Sharp, explained that he had relinquished the DO duties on August 3, 2012, about one month before the incident. According to Captain Sharp, Captain Everitt Leaf had been accepted by the CMO and listed as the new DO in the Ops Specs about a week prior to September 18, 2012.

4.1.2 Chief Pilot

The GOM section 1.2.8 stated the chief pilot had the authority and responsibility to manage the pilot group, ensure proper training, ensure continuous development of flight personnel, maintain pilot records, publish and distribute flight documents and manuals, and determine the qualifications for and supervise the hiring of new pilots. The GOM also stated the chief pilot was the primary contact for the FAA Principal Operations Inspector (POI) regarding aircraft operations and pilot training, checking and performance issues. The chief pilot stated he sometimes received FAA SAFO's and INFO's from inspectors but did not know if anyone at Era was on the automatic distribution for those documents.

The chief pilot stated in an interview that he was not aware of changes to the PTS standards regarding stall recovery.

4.1.3 Assistant Chief Pilot

The GOM section 1.2.9 stated the assistant chief pilot was responsible to maintain the flight operations training program (FOTP), manage pilot training and checking records, and to manage both classroom and instructor assignments and to conduct certain training himself. The assistant chief pilot stated in an interview that the company's stall recovery procedure was to minimize altitude loss and the minimum acceptable altitude loss was 100 feet. He was not aware of any plan to change stall training.

4.2 Safety Management

Era Aviation's GOM, chapter 3, "Safety Program and Reporting," paragraph 3.0.2, "Safety Program Goals," stated:

"The fundamental goals of the Company's Safety Program are:

• To prevent the occurrence and recurrence of all incidents and accidents.
• To protect the employees from injury and illness.
• To foster an open and positive safety culture which emphasizes employee participation and involvement."

4.2.1 Director of Safety

The Era Aviation GOM, paragraph 3.05, "Safety Management," stated:

"The Director of Safety (DOS) reports directly to the President on all matters pertaining to aviation and industrial safety. The DOS is responsible for Company-wide safety awareness, injury and illness prevention and for overseeing the safety program. The Director of Safety advises the President and the Safety Management Committee of methods to improve the accident prevention program. The DOS monitors the education and training of all flight, maintenance and ground support personnel that are involved in flight operations. The DOS will investigate serious incidents and all aircraft accidents."

4.2.2 Vice President of Safety, Era Alaska

The position of vice president of safety, Era Alaska, was not mentioned in the Era Aviation GOM or in the company's operations specifications. The vice president stated in an interview he reported to the board of Hoth LLC, the company that had bought the 3 air carriers, on all aviation safety activities of Era, Frontier, and Hageland Aviation. He mostly facilitated Frontier and Hageland's issues. He began working in 2006 in record safety for Hageland and began the company's involvement with Medallion Foundation. Initially, the ASAP program in Alaska did not include 14 CFR part 135 operations. Medallion was able to include 14 CFR part 135 operations in ASAP in the state of Alaska and he became the facilitator for Hageland.

4.2.3 Safety Reporting

Era provided several safety reporting systems for the use of employees. One system was a hazard reporting system, explained in GOM paragraph 3.4.4. A Safety Hotline, including a website, a 24 hour toll free phone number, and cell phone access to the DOS was provided. Incident and Irregularity reports, explained in paragraph 3.4.7, were to be filed using a system called "WBAT,"[32] and use of this system was mandatory for any employee involved in an incident or accident. According to the Era DOS, about 600 WBAT reports had been filed, 1/5 of which were filed by pilots.

ASAP

[32] According the www.wbat.org, WBAT stands for web based application tool, a comprehensive software system used for safety data collection, management and analysis.

Era also was a participant in an Aviation Safety Action Program (ASAP), described in the GOM, paragraph 3.4.14. Era Aviation did not have its own ASAP program. The ASAP was operated by the Medallion Foundation, a separate safety organization which managed safety data for multiple smaller aviation operators in Alaska. The GOM stated in a note:

> ***"NOTE:** Any personnel involved in reporting an event through the ASAP process should not report the event via the Company's internal Hazard or Irregularity reporting process, unless specifically requested to do so by a Director or Manager."*

The GOM also stated:

> *"The ASAP reporting process complements the internal Company reporting system by offering an opportunity of immunity for involved individuals where a violation of the FAR's may have occurred. The ASAP reporting system is not intended to be used for reporting an event where no violation of the FARs is suspected."*

The Era DOS stated in an interview that there had been 14 ASAP reports in 2012 and 10 in 2011. He said a few years ago a pilot filed an ASAP report and later lost his certificate to FAA action. As a result there was "bad blood" at Era about ASAP. Pilots were reluctant to file reports for fear of retaliation. Medallion was trying to improve and increase awareness but the FAA was perceived by pilots to be "a bully."

The Vice President of Safety of Era Alaska stated in an interview that Era Alaska had had the ASAP program for about 3 years. He stated that the ASAP at Era was designed to encourage pilots to report safety issues; however, at one point a report had been used for disciplinary action taken against a Hageland employee. News of that incident got out in the pilot community in Alaska and there was a period of 3-6 months when no reports were filed.

FOQA

The Era Aviation DOS stated in an interview that the company was studying a flight operations quality assurance (FOQA) program and was considering adding this capability to two of its airplanes, but there was no target date set.

The Era Aviation DOS stated that oil companies that chartered Era aircraft wanted the company to have both FOQA and LOSA[33] safety programs and the company was in the process of developing a Safety Management System (SMS).

5.0 Additional Information

5.1 DHC-8 Stall and Loss of Control during Climb 27 May 2005

The Transportation Safety Board of Canada (TSB) published Aviation Investigation Report A05A0059 following the stall and loss of control of a Provincial Airlines DHC-8-100 on May

[33] Line operational safety audit

27, 2005. The report can be found on the TSB website. The following excerpt from the report is provided for comparison to the event now under investigation:

"Through about 8000 feet, the airspeed started a gradual decrease from 170 KIAS over a period of five minutes. During this time, the vertical speed continued at a constant 1190 fpm up. The gradual decrease in airspeed was detected when the first officer looked up from his paperwork, noted the decreased airspeed, and advised the captain. The captain then rotated the pitch control wheel on the flight guidance controller toward nose down to increase the airspeed. While attempting the adjustment, the captain saw the aircraft's stick shaker activate, causing the autopilot to disengage. This occurred at 14 800 feet above sea level, at 104 KIAS. The captain then began to manually fly the aircraft.

Within a second of autopilot disengagement, the aircraft began to roll right and pitch down. Immediately after the aircraft began to roll, it was noticed that there was ice on the left engine inlet. The roll angle increased to 64º, the pitch angle went from 15º nose up to 5º nose up, and the aircraft vertical acceleration dropped to approximately 0.5 g. The aircraft pitch then increased to 30º nose up briefly before decreasing to 40º nose down. These conditions are indications that the aircraft wing had fully stalled. However, the captain interpreted the indications as severe turbulence.

The FDR data show that the aircraft underwent three distinct stalls during the loss-of-control event, with the third stall being the most severe. The data show that the control column position cycled rapidly back and forth as the stall developed, but was moved generally aft, remaining aft during all three stalls. There was significant aileron and rudder pedal movement during the event, but these controls were ineffective in regaining control and were in response to the aircraft's movement, rather than the cause of it. The data indicated that aircraft control was regained when the control column was moved forward.

5.2 FAA Guidance on Stall Recognition and Recovery

5.2.1 FAA InFO 10010 - Enhanced Upset Recovery Training

The FAA issued InFO 10010, "Enhanced Upset Recovery Training" on July 6, 2010. It stated, in part:

> *"Although the overall accident rate has decreased, the category of loss of control (LOC) continues to outpace other factors as the leading cause of fatal accidents in the last 20 years. A recent NASA sponsored study has defined LOC as "flight outside of the normal flight envelope, with nonlinear influences, and with an inability of the pilot to control the aircraft."*
>
> *"In 1998 a Federal Aviation Administration (FAA)/Industry work group co-chaired by Boeing, Airbus and the Flight Safety Foundation developed the Airplane Upset Recovery Training Aid as training program guidance for upset recovery training for air carrier flightcrews."*
>
> *"The FAA strongly recommends incorporation of applicable sections of the Airplane Upset Recovery Training Aid into training programs. The modular design of the aid allows training departments to utilize all of the segments that are applicable to specific training programs."*

5.2.2 FAA SAFO 10012 - PTS Minimal Loss of Altitude

The FAA issued SAFO 10012, "Possible Misinterpretation of Practical Test Standards (PTS) Language "Minimal Loss of Altitude " on July 6, 2010. It stated, in part:

> *"Specifically, some programs inappropriately stress maintaining altitude during recovery or have arbitrarily assigned a predetermined value (in feet) as an evaluation criteria."*
>
> *"Operators and Training Centers are encouraged to ensure that their training program and checking modules are written and administered to ensure the evaluation criteria for a recovery from a stall or approach to stall does not mandate a predetermined value for altitude loss."*

5.2.3 FAA Practical Test Standards (PTS)

The FAA's PTS for the ATP certificate, FAA-S-8081-5F, was revised April 4, 2012 to reflect a change in stall recognition and recovery procedure. Specifically, the ATP PTS section IV, Inflight Maneuvers, Task B, Approaches to Stalls and Stall Recovery, was modified. The following note appended to the section explains the change:

> *"Evaluation criteria for a recovery from an approach to stall should not mandate a predetermined value for altitude loss and should not mandate maintaining altitude during recovery. Valid evaluation criteria must take into account the multitude of external (such as density altitude) and internal variables (i.e., airplane mass, drag configuration and powerplant response time) which affect the recovery altitude."*

5.2.4 FAA AC 120-109 Stall and Stick Pusher Training

The FAA published Advisory Circular (AC) 120-109, "Stall and Stick Pusher Training," on August 6, 2012. The goal of this AC was to provide best practices and guidance for training, testing, and checking for pilots, within existing regulations, to ensure correct and consistent responses to unexpected stall warnings and stick pusher activations.

Core principals of this AC included:

- Reduction of AOA is the most important response when confronted with a stall event.
- Evaluation criteria for a recovery from a stall or approach-to-stall that does not mandate a predetermined value for altitude loss and should consider the multitude of external and internal variables which affect the recovery altitude. (Reference: Safety Alerts for Operators (SAFO) 10012, Possible Misinterpretation of the Practical Test Standards (PTS) Language "Minimal Loss of Altitude").
- Realistic scenarios that could be encountered in operational conditions including stalls encountered with the autopilot engaged.
- Pilot training which emphasizes treating an "approach-to-stall" the same as a "full stall," and execute the stall recovery at the first indication of a stall.
- Incorporation of stick pusher training into flight training scenarios, if installed on the aircraft.

5.2.5 FAA National Policy on Enhanced Stall and Stick Pusher Training

The FAA published "Enhanced Stall and Stick Pusher Training," N 8900.205, on January 11, 2013. It was directed primarily at POI's of 14 CFR part 121 and part 135 operators, 14 CFR part 91K program managers, and TCPM's (training center program managers) of 14 CFR part 142 schools, and it discussed the principles in AC 120-109. The action required was:

> *"Within 180 days following the issuance of this notice, POIs and TCPMs shall encourage their assigned certificate holder(s) to incorporate the educational material, training methods, and recovery procedures contained within AC 120-109."*

5.3 Era Ops Bulletin 1-12

On November 10, 2012, Era issued Ops Bulletin 1-12, "9-5 Incident Post Flight Directive/Procedural Changes." The key provisions were:

- Minimum enroute climb airspeed shall be 130 knots.
- Standard climb power will normally be used.
- DHC-8 climb power will be taken from the chart "type II – 1050 RPM."
- Use of VS mode in climb will be prohibited.
- Max continuous power will be used to exit icing conditions greater than light icing.
- Pilot flying (PF) will normally maintain contact with the power levers.

The company also stated that they would review the pilot hiring and upgrade process and would institute full stall entry and recovery training.

6.0 FAA Oversight

6.1 Denali Certificate Management Office

An FAA principal operations inspector (POI) in the Denali certificate management office (CMO) in Anchorage, Alaska was assigned to oversee Era Aviation. The POI had been employed by the FAA for two years at the time of incident and had been POI at Era for about 6 months. He stated in an interview he had been type rated in the DHC8 aircraft for about one year and had conducted more than 30 enroute observations and IOE (initial operating experience) flights with Era pilots. He had conducted the incident captain's DHC8 type rating examination in April and his IOE flight check in May, 2012. Following the incident flight he had interviewed both pilots.

The POI stated in an interview that he thought Era was a viable operator. He thought the 14 CFR part 119 management[34] was heavily tasked with additional duties. He found that Era pilots followed policies and procedures and were engaged in their duties, but he had concerns about out station personnel being outsourced, availability of charts for pilot use during flight operations, and inadequate flight dispatch information provided to pilots. He expected to have a high

[34] Director of operations, director of maintenance, chief inspector, director of safety and chief pilot

workload at Era due to pilot turnover and the new requirements for second-in-command ATP ratings.

The POI stated that the grading criterion he used for stall recovery during check rides was for pilots to maintain altitude within plus or minus 100 feet. He said the PTS standards were used but he was unaware of the change in April 2012 to PTS stall requirements and was unfamiliar with the new AC on stall training and recovery. He stated the FAA used several methods to keep inspectors informed about policy changes, including quarterly safety meetings, the events based currency program, and the flight standards information management system (FSIMS).

The previous POI had been assigned to Era for about two years. He stated in an interview his relations with the Era DO and chief pilot were sometimes a bit adversarial. He stated that management oversight was deficient and he wanted them to be more proactive. He also stated the company was in flux, there was turnover, people were leaving and more type ratings would be required in the near future. He had found it necessary in June, 2011, to threaten the company with certificate action if they did not remove certain documents from company aircraft. He stated the flight standards manuals (FSM) and quick reference handbooks (QRH) for both the company BE-1900 and DHC8 were not approved or accepted by the FAA.

A front line manager in the Denali CMO supervised the POI's. She stated in an interview that she thought Era management was able but a very slim organization with each responsible party wearing too many hats. She said Era needed to create an organization with sufficient people doing the right thing at the right time. She stated the company manuals needed to be designed to support the organization and the POI had tried to communicate what they lacked in procedures and manuals. She felt the removal of the company's FSM's was appropriate because they did not conform to the aircraft flight manuals. She had personally visited the company four times in the previous year.

The CMO manager stated in an interview that he could not say why Era officials and the POI were not aware of a change to the PTS standards with regard to stall recognition and recovery.

6.2 DPE Lane

The event FO had received his initial ATP certificate from a DPE, Mr. Ed Lane, in Kingman, Arizona. According to the FAA notice N8900.194, dated July 13, 2012, the FAA revoked that examiner's DPE status in December 2012.[35] The FAA began rechecking every pilot who had received a certificate from him in the previous two years if they had not subsequently completed a successful examination from an FAA inspector or designee. The FAA estimated that as many as 540 pilots may have needed to receive a re-check. According to the FAA, the DPE had conducted 1,519 certificate checks over a five year period. He was employed by a flight school, Sheble Aviation, which, according to FAA data, had conducted 5,288 certificate checks over a five year period. The results of the FAA actions had not been completed at the time of this investigation.

[35] See attachment 9

F. LIST OF ATTACHMENTS

Attachment 1: Interview summaries
Attachment 2: Operations organization chart
Attachment 3: Climb and cruise power charts
Attachment 4: Stalling speeds chart
Attachment 5: Vertical speed mode selection and display
Attachment 6: Speed control indicator
Attachment 7: AFM high angle of attack procedure
Attachment 8: Era approach to stalls guidance
Attachment 9: FAA notice 8900.194